

WHAT IS CLAIMED IS:

1. (currently amended) A method for translocating a non-viroid RNA into a chloroplast, the method comprising:

introducing a DNA into a plant cell such that the transcribed DNA has a chloroplast-localizing sequence (CLS), the CLS having substantial homology with a chloroplast-replicating, cleavage-inactivated viroid sequence, or consisting of at least part of a chloroplast-replicating cleavage-inactivated viroid sequence, the transcribed DNA additionally containing a non viroid RNA sequence fused to the CLS in a non-naturally occurring association;

~~wherein, contacting the chloroplast with an RNA comprising a first RNA sequence, and a second RNA sequence, the first RNA sequence consisting of a chloroplast localization sequence (CLS), the second RNA sequence characterized by its non-natural association with the first RNA sequence; and~~

translocating the non-viroid RNA into the chloroplast.

2. (canceled)

3. (canceled)

4. (currently amended) A method according to claim 1 ~~2 or 3~~, wherein the viroid is an Avsunviroidae viroid.

5. (original) A method according to claim 4 wherein the viroid is an Avocado sunblotch viroid.
6. (currently amended) A method according to claim 4, wherein the viroid is a peach latent mosaic viroid ~~virus~~.
7. (currently amended) A method according to claim 4, wherein the viroid is ~~selected from~~ a chrysanthemum chlorotic mottle viroid, ~~and eggplant latent viroid~~.
8. (original) A method according to claim 1, wherein the second RNA sequence encodes a whole or a part of a target protein.
9. (original) A method according to claim 8, wherein the target protein is a herbicide-resistant protein.
10. (original) A method according to claim 9, wherein the herbicide- resistant protein is selected from 5-enolpyruvylshikimate-3-phosphate synthase and acetolactate synthase.
11. (original) A method according to claim 8, wherein the target protein is an insecticidal toxin.
12. (currently amended) A method according to claim 11, wherein the insecticidal toxin is a Bacillus thuringiensis ~~thurigensis~~-toxin.

13. (original) A method according to claim 8, wherein the protein is a marker protein.

14. (original) A method according to claim 13, wherein the marker protein is green fluorescent protein.

15. (currently amended) A method according to claim ~~1~~ 8, wherein the protein is a metabolic enzyme.

16. (currently amended) A method according to claim ~~15~~ 8, wherein the metabolic enzyme is fructose 1,6-bisphosphate aldolase.

17. (original) A method according to claim 1, wherein the second RNA sequence has a length of less than 10kb.

18. (original) A method according to claim 1, wherein the RNA is a product of transcription of a DNA.

19. (original) A method according to claim 18, wherein the DNA is located in the nucleus of a plant cell containing the chloroplast.

20. (cancelled)

21. (currently amended) A method according to claims 19 or 20, wherein the RNA ~~DNA~~ is introduced into the plant cell by a viral vector.

22. (original) A method according to claims 19 or 20, wherein the DNA is introduced into the plant cell by a physical or chemical means.

23. (withdrawn) A method according to claim 1, wherein the RNA is a product of RNA replication.

24. (withdrawn) A method according to claim 23, wherein the RNA is introduced into cytoplasm of a plant cell containing the chloroplast by an RNA virus.

25. (original) A method according to claim 1, wherein the RNA further comprises an untranslated region sequence located between the first RNA sequence and the second RNA sequence.

26. (original) A method according to claim 1, further comprising a third RNA sequence encoding part or whole of a second protein.

27. (withdrawn) A method according to claim 1, wherein the second RNA sequence in the RNA encodes a first part of a protein and wherein the chloroplast contains a second RNA, the second RNA comprising a first RNA sequence and a second RNA sequence wherein the first RNA sequence is a ribozyme sequence and the second RNA sequence encodes a second part of the protein.

28. (withdrawn) A method according to claim 27, wherein the first RNA and the second RNA are trans-spliced to form an RNA capable of being translated into the protein.

29. (withdrawn) A method according to claim 28, wherein the ribozyme is a self-splicing group I ribozyme.

30. (withdrawn) A method according to claim 29, wherein the ribozyme is a Tetrahymena thermophila intron I trans-splicing ribozyme.

31. (withdrawn) A method according to claim 27, wherein the second RNA is encoded by a DNA containing a gene fragment fused to a DNA sequence encoding the ribozyme.

32. (currently amended) A method for expressing a whole or a part of a target protein in a chloroplast, the method comprising:

contacting the chloroplast with an RNA comprising a first RNA sequence and a second RNA sequence, the first RNA sequence consisting of a chloroplast localization sequence (CLS) wherein the CLS sequence shares substantial homology with a chloroplast-replicating cleavage-inactivated viroid or consists of at least part of a chloroplast-replicating cleavage-inactivated viroid, the second RNA sequence encoding a whole or part of the target protein so that the first RNA chaperones the second RNA into the chloroplast; and

(a) expressing the whole or part of the target protein in the chloroplast.

33. (withdrawn) An RNA comprising: a first RNA sequence which is substantially homologous to a segment of an avocado sunblotch viroid (ASBVd) and is characterized by a chloroplast localizing activity and a second RNA sequence which when translated, corresponds to part or all of a protein.

34. (withdrawn) An RNA according to claim 33, wherein the segment corresponds to at least 100 nucleotides of the ASBVd.

35. (withdrawn) An RNA comprising: a first RNA sequence which corresponds to a viroid and is characterized by a chloroplast localization sequence and a second RNA sequence which when translated, corresponds to part or all of a protein.

36. (withdrawn) A bacterial cell containing at least one RNA characterized in claim 33 or 35.

37. (withdrawn) A plant cell containing at least one RNA characterized in claim 33 or 35.

38. (original) A virus containing an RNA, or a DNA encoding the RNA of claim 33 or 35.

39. (original) A plasmid containing a DNA sequence for transcribing the RNA of claim 33 or 35.

40. (withdrawn) An RNA according to claim 33 or 35 wherein the protein is selected from a herbicide-resistant protein, a pesticide-resistant protein, a marker protein and a metabolic enzyme.

41. (withdrawn) A method of expressing a protein in a plant so that undesired gene flow in the environment is prevented, comprising:

(a) introducing into the nucleus of the plant, a first DNA wherein the first DNA comprises a first DNA sequence and a second DNA sequence such that the first DNA sequence is transcribed to form a first RNA sequence having a chloroplast localization sequence and the second DNA sequence is transcribed to form a second RNA sequence encoding a first part of a protein;

(b) introducing into the chloroplast of the first plant, a second DNA, wherein the second DNA comprises a third DNA sequence and a fourth DNA sequence such that the third DNA sequence is transcribed to form a ribozyme and the fourth DNA sequence is transcribed to form a fourth RNA sequence encoding a second part of the protein;

(c) permitting transcription of the first DNA and its translocation into the chloroplast for trans-splicing of the second RNA sequence to the fourth RNA sequence for translation into the protein; and

(d) inhibiting undesired gene flow in the environment.

42. (withdrawn) A method according to claim 41, wherein the first fusion protein of step (a) comprises a fifth DNA

sequence which is transcribed to form a fifth RNA
sequence which after localization in the chloroplast is
spliced to a sixth RNA to form a replicase protein.

43. (withdrawn) A plant cell according to claim 41, further
comprising a replicase translated from an exogenous
nucleic acid contained in the plant cell.